into the heart. In young specimens of *Pardosa* I have seen globules leave the two abdominal currents, some near the spinnerets and the others towards the middle of the ventral face, pass round the sides of the abdomen and fall directly into the pericardium. Finally, in some young individuals of *Pardosa* and *Heliophanus* globules, instead of penetrating into the lung, skirted its external border, and then, circulating beneath the integument, passed directly into the pericardium.

In conclusion : the vascular system, which is very little ramified in newly hatched spiders, becomes complicated later on ; the venous blood circulates in a very extensive series of lacunæ. The whole of the venous blood of the cephalothorax is arterialized before reaching the heart ; a portion of that of the abdomen returns directly to the pericardium, and from thence to the heart, without passing through the lungs.—*Comptes Rendus*, t. cxiv. no. 18 (May 2, 1892), pp. 1035–1038.

A Contribution to the Knowledge of the Anatomical Structure of the Sexual Organs in the Galeodidæ. By A. Birula, of the Zootomical Institute of the University of St. Petersburg. (Provisional Communication.)

The chief results of my investigations into the anatomico-histological structure of the genital organs in the Galeodidæ are the following.

My studies were conducted upon :—

a. *Galeodes araneoides*, Pall. (♂ & ♀);
b. *Galeodes ater*, Bir. (♀).

The male genital organs are constructed as follows :—

1. The external genital aperture is represented by a longitudinal slit in the protuberance of the posterior margin of the first abdominal segment ;

2. Aciniform (so-called accessory) glands, with a chitinized intima, open into the uterus masculinus, which is clothed with chitin ;

3. Each of the seminal ducts (vasa deferentia) divides in the third abdominal segment into two rami, which, suddenly narrowing, pass into the filiform testes ;

4. In the walls of each vas deferens, at their opening into the uterus masculinus, lie aciniform accessory glands, with columnar epithelium, but without an intima ;

5. At the period of the maturity of the sexual products the end of each ramus of the vasa deferentia, which is histologically indistinguishable, swells up into a vesicle and functions as a vesicula seminalis ;

6. The testes consist of four thin and very long coiled tubes, which,

before they open into the vesicula seminalis, lose their typical epithelium and form

7. The special glandular portion, which serves to secrete the chitinous substance for the membrane of the spermatophores;

8. The semen enters the sexual organs of the female in the form of oval and somewhat flattened spermatophores.

The female sexual organs are constructed in the following manner:—

1. The external genital aperture has the same appearance as in the male;

2. The vagina is clothed with a thick chitinized intima;

3. The receptacula seminis are represented by two vesicles with chitinized intima, and open into the vagina in the neighbourhood of the genital aperture;

4. On its posterior wall the uterus is provided with two auriculate appendages, which do not differ in histological structure from the remaining portions of the uterus, and, as it appears, play no physiological part whatever;

5. The oviducts pass immediately into the ovaries. The walls of these two sections are longitudinally folded, in consequence of which when the sexual organs become filled with ova or spermatophores they are capable of considerable expansion, whereby the cavity of the organs is increased; they consist of (*a*) the external adipose layer, (*b*) the circular musculature, (*c*) the longitudinal musculature, (*d*) the tunica propria, and (*e*) the columnar epithelium. In the first three layers an abundant ramification of tracheæ is observable;

6. The ova develop from a special epithelial layer, which clothes the wall of the ovaries on the interior;

7. The ripe ova, which already lie in the follicles which become evaginated, have a so-called "stylum"*;

8. In the cavity of the ovaries and of the oviducts there may be observed a considerable number of free cells which bear a strong resemblance to the blood-corpuscles. The cells possess the power of amœboid movement and exhibit figures of karyokinetic division. They demolish the envelopes of the spermatophores, thereby liberating the spermatozoa, and at the same time destroy the superfluous spermatozoa and the unfertilized ova†;

9. The ripe ova fall into the cavity of the ovaries, where the development of the embryo is completed;

10. Even before the formation of the rudiments of the appendages a great difference in form is noticeable between the thoracic

* Bertkau, "Ueber den Generationsapparat der Araneiden," Archiv f. Naturgeschichte, 1875, p. 245.

† Corpuscles of this kind have been described by Prof. A. Schneider in *Nephelis*, *Aulostomum*, and *Hirudo*—A. Schneider, "Ueber die Auflösung der Eier und Spermatozoen in den Geschlechtsorganen," Zool. Anz. 1880, no. 46, p. 19.

and abdominal segments of the germinal streak. The segment which bears the cheliceræ is separated later than the remainder of the thoracic segments, at a period when from three to four abdominal segments have arisen from the caudal section;

11. The segmentation of the appendages appears at a somewhat early stage;

12. There are no embryonic envelopes;

13. A flexure of the embryo takes place, as in the Araneina;

14. The lateral organs, which were described by Croneberg *, are represented in younger stages by large elongate vesicular sacs, which are connected with the body above the first pair of legs by means of a thin stalk. In the young immediately after birth the lateral organs are considerably diminished in size and shrunken. In the adult animal, apparently, the linguiform triangular folds of skin which are found beneath the mandibles must be regarded as a remnant of the lateral organs.—*Biologisches Centralblatt*, xii. Bd., no. 22 (November 15, 1892), pp. 687–689.

On Two Species of Myzostoma *parasitic upon* Antedon phalangium, *Müller*. By M. Henri Prouho.

Antedon phalangium is the host of two species of *Myzostoma* described by von Graff under the names *Myzostoma pulvinar* and *M. alatum*, and which were both discovered in the Minch during the expedition of the 'Porcupine.' I have met with these two parasites on their usual host in the dredgings made in the course of last summer by the boat belonging to the Arago Laboratory; and this enables me to communicate forthwith certain interesting features in the history of these Myzostomidæ, which are so little known. I pass over the anatomical and histological details, which will be dealt with elsewhere.

Myzostoma pulvinar.—Herr von Graff, whose description of this species was founded upon a unique specimen, has well characterized its external form; he has drawn attention to the dorsal position of the mouth and the cloacal orifice, but he must have been led astray by the bad state of preservation of the specimen which he studied, for he states that the organs which are known in the other species of *Myzostoma* under the name of *suckers* are absent in this form, though these structures are really present, although not so well developed as in the majority of the other species.

Contrary to the opinion of von Graff, *Myzostoma pulvinar* does not live upon the disk of *Antedon phalangium*; it inhabits the

* A. Croneberg, "Ueber ein Entwicklungsstadium von *Galeodes*," Zool. Anz., 10 Jahrg., 1887.